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LEAD AND ZINC ORES IN BLAIR COUNTY, PENNA.

By

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Location.

Although Pennsylvania is not now a producer of lead or zinc ore there have been times when the output of this State was important. At the present time when recently organized companies are seeking capital to re-open old mines, information about the deposits that once were mined with some success may be particularly useful.

The lead and zinc deposits of Blair County¹ are confined to Sinking Valley which extends from Little Juniata River in a southwesterly direction about ten miles. Two mountain ridges of sandstone flank the limestone valley on the northwest and southeast, and, uniting just east of Altoona, close the south end of the valley. The limestones of the valley belong to the great Cambro-Ordovician limestone series. The valley is about five miles wide along the Little Juniata but gradually narrows as the bounding ridges come closer together.

Within the limestones of the valley lead and zinc minerals have been found in many places. Much prospecting seems to indicate that the only localities which might justify the expenditure of money and effort in the search for ore are in the two ends of the valley. These are the only places where mining has been carried on. The chief ore bodies are those about one-fourth mile southwest of Birmingham Station, east of Tyrone. Others are near the end of the valley called the "Kettle" east of Altoona.

¹Platt, Franklin, Zinc and lead deposits of the Sinking Valley, Second Pennsylvania Geol. Survey, Vol. T, pp. 247-277, 1881



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History of Mining Operations.

The first lead and zinc mines of Pennsylvania were operated in the Sinking Valley, Blair County, during the Revolutionary War. The Continental Army being in great need of lead for bullets, a party was sent to investigate some lead deposits said to be in the Wilderness near Frankstown. As a result of the examination General Daniel Roberdeau opened and worked some shallow mines in the southern end of Sinking Valley during 1778 and 1779. Several letters from General Roberdeau and others concerning these operations are in the Pennsylvania Archives (First Series) especially in Vols. 6, 7, and 8. At one time 1,000 pounds of lead was sold to the State at \$6.00 a pound in the depreciated currency of that period. It is not known when the mines closed but probably the operations were short-lived because of the expense of transporting materials for mining and smelting the ore, the maintenance of the laborers in the Wilderness, as it was called, and the guards that were necessary on account of hostile Indians.

The next period of active mining was in 1795 when John Musser was employed by Robert Morris to drive a drainage tunnel into the side of the hill near Birmingham to connect with a shaft previously sunk. No further information is available concerning this undertaking.

It seems that there was little if any more work done until 1864 when the Keystone Zinc Company was organized and with abundant capital started operations on a large scale. Most of the work was done in the northern part of the valley near Birmingham but investigations by this company and others were made in a number of places in the southern part of the valley. New shafts and tunnels were driven and a large reducing plant for the manufacture of zinc oxide was built near Birmingham for the treatment of ores from this and other regions. In this attempt the principal attention was given to zinc while in the previous operations only lead was sought and the zinc minerals present were regarded as worthless or as part of the gangue. After six years, during which several thousand tons of ore were mined, the company became financially involved and the plant was closed in 1870. Since that time there have been sporadic efforts to discover workable ore beds in various parts of the valley but with indifferent success. In 1875 some diamond drill boring was done in the southern part of the valley and in 1876 a small quantity of ore from another property was mined and shipped to the Bamford reduction plant near Lancaster.

The latest known attempt to re-open the mines was in 1901 when a certain company issued a prospectus and endeavored to interest capital in the project. This is said to have been merely a stock-selling scheme.

At present the mines are in bad condition although the writer was able to go down one of the old shafts near Birmingham in the summer of 1921 and to see something of the old drifts and stopes that are above water level.

Occurrence and Character of the Ore.

The dolomitic limestone strata of Sinking Valley form a slightly overturned anticlinal fold that extends throughout the valley with the axis pitching to the southwest. The close folding has shattered the rocks and metal-bearing solutions have deposited the lead and zinc ores in the crevices.

In the Birmingham region where a number of shafts were sunk and an adit driven 347 feet into the side of the hill only one important vein seems to have been encountered, although there were many cross veins and off-shoots. This vein seemed to parallel the strike of the enclosing limestone strata, about N. 65°E., and was near the crest of the anticlinal fold. Slickensides were observed on the ore and the wall rocks, showing movement subsequent to the deposition of the ore. One drift 167 feet long followed a vein said to have averaged somewhat more than seven feet in thickness. No statement is given as to the relative proportions of gangue and ore minerals.

In the south end of the valley the veins cut across the strata. Many were prospected over a considerable area but it is said that few were more than six inches wide, although one was found with a width of 14 inches. Again no data concerning the constitution of the veins are available.

The ores consisted primarily of sphalerite and galena with dolomite, barite, pyrite, and "no inconsiderable amount of brown, highly ferruginous, argillaceous matter." In the Birmingham region the zinc ore predominated whereas the ores near the "kettle" contained more lead; in some cases the lead content exceeded that of zinc. Smithsonite, calamine and cerusite were found in the upper levels.

Platt¹ gives the following analyses of ore from the Birmingham shafts.

Analyses of Zinc Ore from Birmingham, Blair County, Penna.

| | | | | |
|-----------------------------|-------|-------|-------|-------|
| Silica | 4.53 | 9.67 | 9.67 | 6.90 |
| Carbonic acid | 27.80 | 29.80 | 19.03 | 28.69 |
| Oxide of cadmium | 1.84 | | | |
| Oxide of zinc | 46.95 | 34.50 | 31.10 | 47.50 |
| Lime | 2.48 | 11.08 | 1.17 | 2.17 |
| Sulphur | .74 | .12 | .25 | .18 |
| Lead | 5.44 | .82 | 1.09 | 1.20 |
| Iron, magnesia and water | 10.22 | 14.01 | 37.69 | 13.36 |

¹ Platt, Franklin: op. cit.

Another writer¹ states that "the ore of Sinking Valley, Pennsylvania, treated at the Keystone Works, contained, commonly, 6 to 8 per cent galenite and gave an oxide with 25.084 per cent lead sulphate, 73.246 zinc oxide, and 0.574 zinc sulphate."

Production.

Platt says that more than 2000 tons of ore were mined by the Keystone Company. This probably represents the greater part of all the ore that has been obtained from all the workings in Sinking Valley.

Future Prospects.

The present inaccessibility of the old mines prevents forming definite conclusions concerning the nature and extent of the remaining ore bodies. When the mines were closed in 1870 the prevailing opinion seemed to be that the best of the ores were exhausted. In view of the fact that extensive prospecting had been done in many places both by sinking shafts and by diamond drilling it does not seem probable that the district possesses much merit as a lead or zinc producer.

¹ Williams, Charles P: Trans. Amer. Inst. Mining Eng., Vol. V, p. 425, 1877.

